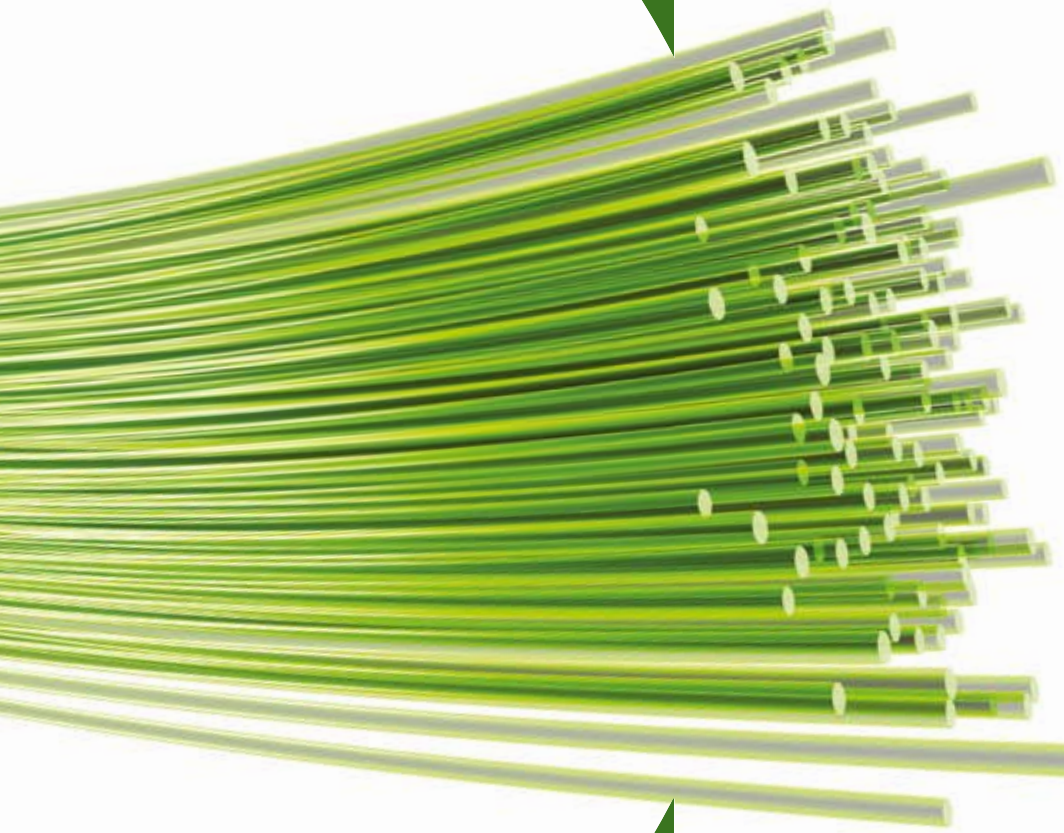
KONTI HIDROPLAST®

PRODUCTION OF POLYETHYLENE AND POLYPROPYLENE PIPES



KONTI KAN DUCT UNDERGROUND CABLE PROTECTION PIPES

www.konti-hidroplast.com.mk

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KONTI HIDROPLAST®

WELCOME TO OUR WORLD

Konti Hidroplast is part of the world's largest manufacturer and supplier of high performance plastic pipes and offers the best and the most cost effective pipe systems for its customers.

Konti Hidroplast specialises in polyethylene pipe systems for gas and water transportation in the utilities and industrial markets.

MARKET ORIENTED

Konti Hidroplast products find a broad range of applications in the industrial and utilities market on a worldwide scale.

The water and gas distribution enterprises are important sectors for high integrity products where the maintenance of water quality and the safe transport of gaseous fuels are of paramount importance.

Industrial applications include alternative energy installations in landfill gas systems to effluent transportation and mineral slurry.

Products are widely used in pipeline installation, repair and maintenance.

Many of the brands in the Konti Hidroplast portfolio have a long record of innovation in meeting the needs of the water and gas utilities.

Being one of the foremost pioneers in polyethylene pipe systems, Konti Hidroplast is continually improving and updating its offer to meet the ever growing needs of the distribution engineer, ensuring they stay at the forefront of world gas and water distribution/treatment systems.

CUSTOMER FOCUS

The key to our success lies in the commitment to provide the highest quality service and support. We are a team of highly motivated and experienced individuals.

We place the utmost importance on meeting the needs of our customers, constantly evolving our extensive product portfolio to meet the ever changing demands of the water and gas utilities, industrial and foreign markets.

QUALITY

Konti Hidroplast is a result-driven busines – its people, products and service. Designed, manufactured and supplied under EN ISO 9001:2000 accredited Quality Management Systems, Konti Hidroplast products comply with relevant national, European and international product standards to ensure complete reliability for our customers.

Besides the ISO certificates for Quality Management Systems and ecology, the gas pipes are also certified by DVGW CERT GmbH.

THE ENVIRONMENT

Committed to sustainable manufacture and systems, Konti Hidroplast operates and maintains an environmental policy fully accredited by ISO 14001.

POLYETHYLENE PIPES – UNDERGROUND CABLE

PROTECTION KONTI KAN DUCT

Konti Hidroplast's polyethylene pipes for protection of underground cable conduits are mainly used for subterranean electrical and optical systems-power and telecommunication networks.

PRODUCTION PROGRAMME

These halogen free high-density polyethylene pipes are available in the following two designs:

1. TELKON

Small size diameter, solid halogen-free polyethylene pipes for optical cable protection conduits (25; 32; 40; 50; 75). They are produced in coils with a length of 500 m.

2. KONTI KAN DUCT

Double wall conduit corrugate pipe – with outside corrugate and inside smooth surface-halogen free conduit pipes (40; 50; 63; 75; 90; 110; 125; 140; 160; 200 mm). They can be supplied in coils of 20 or 50 m or straight pipes 4 and 6 m.

MATERIAL

The pipes are made of high-density polyethylene (HDPE PE), which is characterized by good mechanical and chemical properties, it is environmentally friendly. At the same time the pipes provide economical and long-term solutions for the problems that exist during installation. In general, the PEHD material is used with the following properties:

TEST PARAMETER	UNITS OF MEASURE	NORMS AND SPECIFICATION	REQUIREMENTS
DENSITY	g/cm3	ISO 1183	> 0.947
MFI	g/10 min (190/2.16)	ISO 1133	0.4-1.3
ELONGATION AT BREAK	%	ISO 528	MIN 350
IMPACT RESISTANCE		EN 744	NO CRACKS ALLOWED
LONGITUDINAL ELONGATION (110 C, 60 MIN)	%	EN 743	MAX 3
ESCR	HOURS		MIN 168
FRICTION INDEX		TELECOM METHOD	MAX 0.17

TELKON – SMALL SIZE DIAMETER POLYETHYLENE PIPES

A small size diameter, solid polyethylene pipe, PEHD conduits for protection is currently the best solution for long-term mechanical protection and underground insulation of optical fibre cables. PEHD conduits are best suited for laying directly into the ground, through water dams, into concrete pipes, channels and blocks, along bridges and piers. PEHD conduits are designed to facilitate traditional cable installation methods – pulling through with cord and pneumatic blowing.

TELKON – PRODUCT RANGE

For PEHD cable protection conduits, any of the following solutions for inner surfaces are available:

1. HDPE EXTRUDED PIPE WITH CORRUGATED INNER SURFACE

2. SILICONE COATED PE CONDUIT PIPES are extruded from HDPE material and co-extruded with special lubricant that is distributed uniformly along the entire inner surface of the duct providing a low friction smooth surface for easy cable drawing or blowing.

The outer HDPE layer makes the pipe tougher and more durable and enables the duct to withstand pressure, as well as to retain its roundness under soil pressure and traffic load.

FUNCTIONS:

Laying an optic cable in a polyethylene pipe has several advantages compared to the classical laying of the cables:

- Secures the cable from exterior damage (rocks, roots or other ground manifestations)
- Decreases maintenance costs
- Easy and quick assemblage, without unneccessary friction during cable insertion
- Large lengths are delivered, thus reducing the assemblage costs at minimum
- Excellent corrosion resistance

These polyethylene pipes are also used in construction of buildings or industry facilities, as well as for other infrastructure buildings for protection of a large spectrum of different cables, such as:

- Telephone
- Television
- Optic

ADVANTAGES:

- Proven efficiency in cable networking
- Excellent mechanical properties: compression strength of 750 N
- Temperature resistance from -30 °C up to +70 °C (retention of high impact resistance even at lowest temperatures)
- PEHD material ensures high chemical and corrosion resistance
- Long durability (at least 50 years) at low operation costs
- Easy and reliable connection through a wide range of fittings
- Printed-on markings indicate the length of installed conduit and cable
- The wide range of colours enables segregation of cable network serving different purposes

STANDARDS

The pipes are produced according to the existing international standards:

- **EN 12201**
- **ISO 4427**
- **DIN 8074/8075**
- **EN 61386-24**

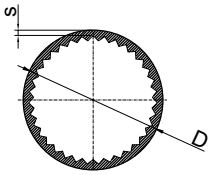
DIMENSION

	SDR 21	SDR17	SDR 13.6	SDR 11	SDR 9
PE 80	PN6	PN 8	PN 10	PN 12.5	PN 16
PE 100		PN 10	PN 12.5	PN 16	PN 20

SDR = D/s
D-diameter /mm

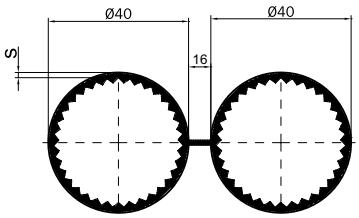
s- wall thickness /mm
PN – work pressure /bar

• SINGLE TELEKON PIPE



D(mm)	s/mm				
	SDR 21	SDR 17	SDR 13.6	SDR 11	SDR 9
16	1.8				
20	1.8				
25	1.8				
32	1.9	2.0	2.4	2.9	3.6
40	1.9	2.4	3.0	3.7	4.5
50	2.4	3.0	3.7	4.6	5.6
63	3.0	3.8	4.7	5.8	7.1
75	3.6	4.5	5.6	6.8	8.4

• DOUBLE PIPE

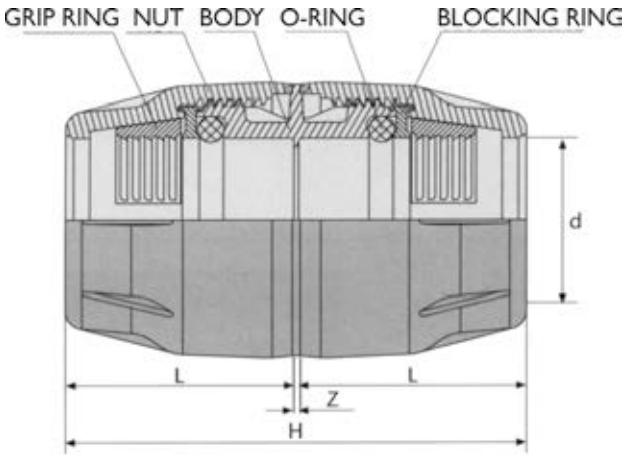


D(mm)	s/mm		
	SDR 21	SDR 13.6	SDR 11
40	1.9	3.0	3.7
50	2.4	3.7	4.6

CONNECTING THE PIPES

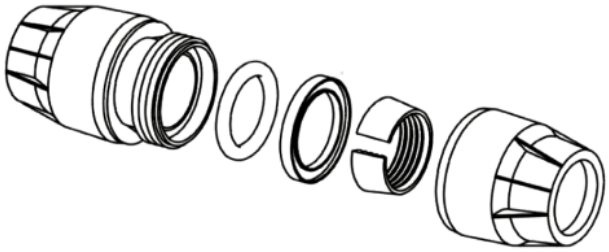
Small diameter, cable protection pipes are connected by mechanical joints, known as COMFIT joints, with dimensions of 32, 40 and 50 mm.

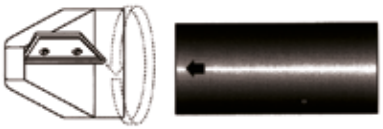
Implementation: for mechanical connection of HD/HP/MD/LD PE pipes in compliance with ISO4427, DIN8074



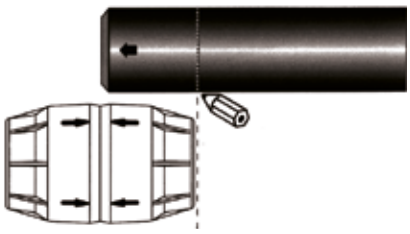
d x d	L	Z	H	E
32 x 32	44.5	1.0	90	56
40 x 40	56	1.2	115	70
50 x 50	71	1.2	145	85

INSTRUCTIONS FOR MOUNTING THE COMFIT

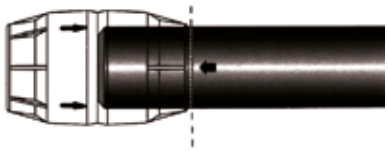




Bevel the pipe



Mark the insertion depth on the pipe



Push the pipe until the mark reaches the fitting

KONTI KAN DUCT – DOUBLE WALL CONDUIT CORRUGATE PIPE

High density – HDPE halogen-free conduits have a double wall design (corrugated external and smooth internal surface) which provides a special impact, compression and chemical resistance.

Compared to the standard corrugated pipes for drainage/irrigation, this kind of pipes meets the requirements of the safety standards for electrical installation EN 61386-24.

They are UV stabilized for protection of earth electrical installation (EN 61386-22)

They fully comply with European legislation, especially with the directives for low voltage 2006/95/EC (LVD) and hazardous substances 2002/95/EC.

ENVIRONMENTALLY FRIENDLY

All production processes in Konti Hidroplast are oriented to minimize power consumption through restoration and replacement of energy inefficient machinery in the manufacturing processes. With these products we are one step further in our mission to become as greener as possible, since we get the chance to invest in alternative forms of energy by using eco-friendly materials.

PRODUCT RANGE OF DOUBLE WALL CONDUIT PIPES

- KONTI KAN ELECTRO FLEX conduit pipe 450 N serie
- KONTI KAN ELECTRO conduit pipe 750 N serie
- KONTI KAN OPTICAL
- KONTI KAN NON-FLAME PROPAGATION

KONTI KAN ELECTRO FLEX CONDUIT PIPE SERIE 450

This is a flexible, double wall, corrugated, halogen-free cable protection PE pipe, whose main application is protection of low voltage electrical and telephone underground cables. It is available in coils of various standard length. Each coil is equipped with coupling.

The high-density polyethylene material is UV stabilized for minimum one year of outside resistance.

The corrugate outside layer assures greater resistance to deflection and flexibility, and the inside smooth layer assures easy cable insertion and slipping. A compression test is performed according to EN 61386-24 ≥ 450 N vertical deflexion equivalent to 5% of the original diameter.

Product dimensions are according to EN 61386-24.

450 N serie pipes can be found in outside red colour (RAL 3020) or otherwise at the customer's request.

A feed cord is supplied with each KONTI KAN ELECTRO FLEX coil. KONTI KAN ELECTRO FLEX is also available without feed cord, at request.

The feed cord is installed in the interior of the conduits during production. It is made of high quality polyester material (PET) and it can be black or in a different colour.

It has minimum strength of 650 Nt in accordance with ISO 2062.

The thickness is min 1.2 mm.

The couplings provide extremely tight connections.

Impact strength: normal

It can be used in a temperature range of -10 / +60 C°

Package according to the table below

OD	40	50	63	75	90	110	125	140	160	200
ID	31.95	39.2	50.2	60.6	75.2	95.6	107.5	122.4	141	179
IN COILS (m)	50	50	50	50	50	50	50	25	25	25
WEIGHT (in kg/coil)	5.9	6.8	9.7	11.7	17.4	21.6	26.7	18	19.4	29.3
BEND RADIUS ≥ (in mm)	350	350	350	350	350	500	600	600	750	750
COLOUR : RED										

KONTI KAN ELECTRO CONDUIT PIPE SERIE 750 +N

This is a double wall, corrugated, cable protection, PE halogen-free conduit pipe, with excellent compression strength and very high impact resistance due to the advanced combination of a corrugated outside layer and a smooth inside layer. The conduit is available in a standard length of 6 m, in bars.

Each bar is equipped with a coupling. The conduits are not packed, but can be palletized at request.

The standard colour is red (RAL 3020) and other colours are available at request.

The high-density polyethylene material is UV stabilized for more then 1 year of outside resistance.

A compression test is performed according to EN 61386-24 ≥750 N vertical deflexion equivalent to 5% of the original diameter.

Impact strength: normal

It can be used in a temperature range of -10 / +60 C°

KONTI KAN ELECTRO is the best solution to apply when high ground tension and constant traffic load is a persistent factor. These pipes are designed for mechanical protection and underground installation for systems of heavy mechanical resistance.

The couplings provide extremely tight connections.

The product dimensions are according to EN 61386-24.

The 750 N series pipes are manufactured in outside red colour or otherwise, at the request of the customer.

Package according to the table below:

OD	50	63	75	90	110	125	140	160	200
ID	39.2	50.2	60.6	75.2	95.6	107.5	122.4	141	179
IN BARS	6	6	6	6	6	6	6	6	6
WEIGHT (in kg/coil)	0.135	0.190	0.235	0.35	0.43	0.53	0.70	0.78	1.15
BEND RADIUS ≥ (in mm)	1300	1600	1900	2300	2800	3100	3500	4000	5000
COLOUR : RED									

COUPLING

The couplings provide extremely tight connections.

KONTI KAN OPTICAL

This double wall, high-density, halogen-free conduit pipe is used for protection of telephone and other underground cables. It conforms with telecommunication rule 671 REV 2001.

The KONTI KAN OPTICAL cable conduit is available in diameters of 40; 50; 63; 75; 90; 110; 140 160; 200 mm in coils of 50 m.

Each coil is equipped with a coupling. The standard colour is blue (RAL 5010) with a black inside surface. Other colours are available at request.

The high-density polyethylene material is UV stabilized for minimum 1 year of outside resistance.

The outside corrugated layer assures greater resistance to deflexion and flexibility and the inside smooth layer assures easy cable insertion and slipping.

A compression test is performed according to EN 61386-24 ≥750 N vertical deflexion equivalent to 5% of the original diameter.

Impact strength: normal
It can be used in a temperature range of -10 / +60 C°

OD	ID	IN COILS (m)	WEIGHT (in kg/coil)	BEND RADIUS ≥ (in mm)	CO-LOUR: BLUE
40	31.95	50	5.9	350	
50	39.2	50	6.8	350	
63	50.2	50	9.7	350	
75	60.6	50	11.7	350	
90	75.2	50	17.4	350	
110	95.6	50	21.6	500	
125	107.5	50	26.7	600	
140	122.4	25	18	600	
160	141	25	19.4	750	
200	179	25	29.3	750	

NON-FLAMABLE PROPAGATION CONDUIT PIPES

The high-density, double wall, corrugated conduit pipes have an outside white corrugate layer and an inside white smooth layer.The pipes have non-flamable propagation performance according to EN 61386-24 and EN 61386-1.

The non-flamable propagation conduit pipes are available in the following dimensions: DN / OD

Each coil is equipped with a coupling. Standard white color outside and inside.

It has a neutral, high-density, polyethylene blend, with coloration that does not spread flames.The high density polyethylene material is UV stabilized for minimum 1 year of outside resistance.

The impact resistance is according to EN 61386-24/ CEI 23-46>600 N with internal diameter deformation of up to 5%.

Impact strength : normal

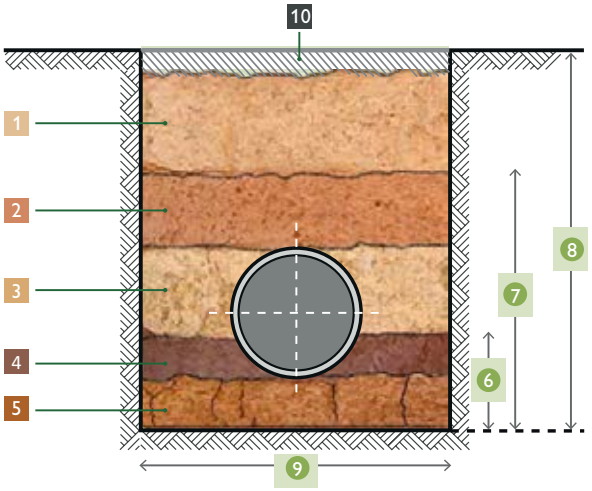
It can be used in temperature range of -10/+60 C°.

BARS and COILS	COILS	COILS
Ø mm	50 m	25 m
40	×	
50	×	
63	×	
75	×	
90	×	
110	×	
125	×	
140	×	
160		×
200		×

INSTALLATION GUIDE

The installation of the conduits in underground networks requires a series of works that need to be carried out as specified in the design so as to ensure the safety of the works and the installation itself. The details on the best practice for safe installation according to the specification of Standard EN 1610 are given below:

DESCRIPTION OF FILLING TRENCH ZONES



1. Main backfill
2. Initial backfill
3. Sidefill
4. Upper bedding
5. Lower bedding
6. Depth of bedding
7. Depth of embedment
8. Trench depth
9. Trench width
10. Bottom of road construction, if any

BASIC INFORMATION ON TRENCHES

When digging a trench for conduit installation, care must be taken to ensure a smooth and even underlying surface. It is best that trenching is performed immediately prior to the laying of the conduits and the backfilling should be performed immediately after their laying.

- Slope and level of the bottom of the trench in accordance with the provided differences in height.
- Dimensions of the excavated sections.
- Evenness of the trench surfaces, bottom and walls.
- Removal of surface and ground water.
- Selection, reuse and temporary storage of the excavated materials and removal of those which are unsuitable.

TRENCH DIMENSIONS

This should be the required minimum for underground network installation and backfill materials compaction in accordance with the diameter of the conduit and its depth of installation. It is recommended that the minimum width of the trench should be greater than the values shown in the two tables below:

MINIMUM RECOMMENDED WIDTH OF TRENCH IN RELATION TO OUTSIDE DIAMETER OF CONDUIT
OD + 400MM
IRRESPECTIVE OF WHETHER THERE IS SUPPORT IN THE TUNNEL IRRESPECTIVE OF THE ANGLE OF INCLINATION OF THE TRENCH WALLS
CONDUITS WITH OUTSIDE DIAMETER OD UP TO 200 MM

MINIMUM RECOMMENDED WIDTH OF TRENCH IN RELATION TO TRENCH DEPTH	
TRENCH DEPTH (M)	MINIMUM TRENCH WIDTH (M)
<1	NO MINIMUM WIDTH REQUIRED
<–1 <– 1.75	0,80
>1.75 <– 4.00	0,90
>4.00	1,00
CONDUITS WITH OUTSIDE DIAMETER OD UP TO 200 MM	

Differences may occur in the above minimum recommended widths in the case of works which do not require a person to be inside the trench or in other special circumstances. A very important factor that needs to be considered at the time of selecting from the above sizes is the installation of more than one conduit in the trench.

TRENCH MATERIALS

The suitability of the ground materials for backfilling the trenches for underground networks depends on their geotechnical properties and their capacity for compaction. The backfill materials can be taken from the excavated materials. When these materials do not meet the requirements, are inexistent or unavailable, then suitable materials must be chosen as specified in the design. It is best to preclude the presence of backfill materials that are larger than 22 mm in diameter. It is also necessary that the backfill materials are free from organic substances (such as leaves, roots, grass etc.), snow and ice since their water content affects compaction. The trenches must be protected from surface water. It would be good to use pumps to remove and drain off any water towards nearby natural receptacles or other suitable receptacles.

INSTALLATION

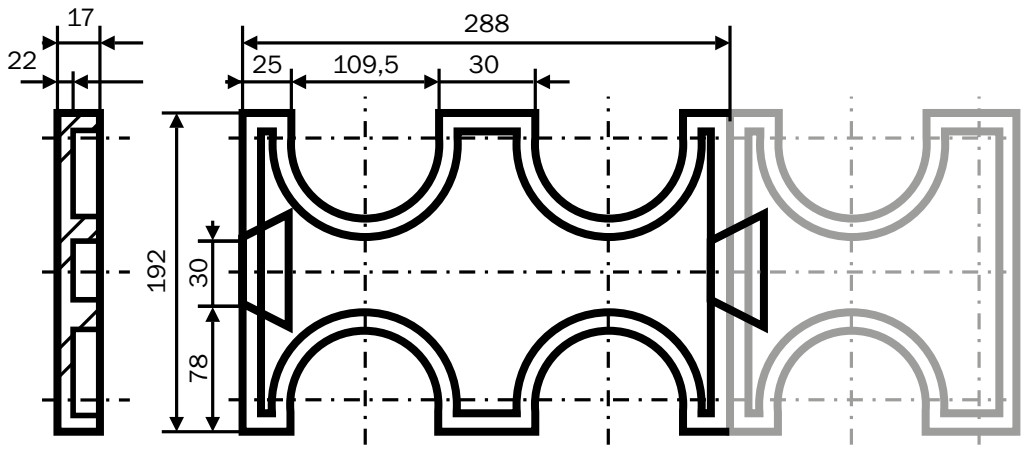
RECEPTION AND TRANSPORTATION TO THE INSTALLATION POINT
The conduits and their fittings must be inspected upon delivery, to see that they bear the correct labels and markings and meet all the necessary specifications laid down in the design. Prior to installation they must be carefully checked for any signs of damage.

STORAGE

The conduits must be stored in such a way as to ensure that they remain undamaged. They must not be placed next to open trenches and their storage area must be clean and free from any foreign bodies such as sharp stones that could cause damage.

LAYING

In the case of interruption of the installation process, or due to a temporary break in the works, or in view of connection at a later date, the ends of the conduits must be sealed with protective caps. The caps must not be removed before the connection process. The area of the conduit that will come into contact with the connection fitting (coupler) must be clean and show no signs of damage. In the process of laying in trenches, when there are several corrugated conduit pipes that need to be laid, to maintain their straight line and stable position, there is a need of separators at a certain distance:



CONNECTION

During the connection process (coupler, trench, etc.) it must be ensured that no foreign bodies can get inside the conduits. In order to achieve this, particular care must be taken when cutting and assembling the conduit.

TRENCHING

After completing the works for digging, shaping and inspecting the bottom of the trench, the next step is the laying of the conduit and backfilling with the material provided for in the design. It is recommended for the conduit to be laid over a substrate (underlying layer) of 100 mm in the case of soil and 150 mm for stony or hard ground, and covered respectively to a height of 300 mm above the highest point of the outside diameter of the conduit (see diagram). It is recommended that the filling and compaction of the trench should be carried out simultaneously on both sides of the conduit. It is suggested that the compaction, the degree of which must be provided for in the design, should be carried out from the wall of the trench towards the conduit in uniform layers using manual equipment. Compaction using mechanical means must not be performed in an area above the pipe zone that is less than 300 mm deep.

When choosing the mechanical means of compaction, the number of drillings and the thickness of the compaction layers, it is necessary to consider the type of compaction material and the type of conduit that will be laid in the trench. Compliance with the above with the specifications provided for in the design must be a priority.

INSPECTION

During the installation, in addition to visual checks, the following checks must also be performed: checks for any deformation of the conduits, change in the degree of compaction and the adequacy and effectiveness of the laying. Checks in the degree of compaction must be carried out throughout the works. The surface on which the conduits are laid must be thoroughly inspected and meet the requirements of the design regarding its degree of slope and evenness.

Impact test : (acc. to European standard EN 61386-24)

	LIGHT (L)			NORMAL (N)		
NOMINAL CONDUIT DIMENSION (mm)	HAMMER MASS (kg) +1% - 0%	HEIGHT OF FALL (mm) 1%	FORCE OF MASS (JOULE)	HAMMER MASS (kg) +1% - 0%	HEIGHT OF FALL (mm) 1%	FORCE OF MASS (JOULE)
≤ 60	3	100	3	5	300	15
61 TO 90	3	200	6	5	400	20
91 TO 140	3	400	12	5	570	28
> 140	3	500	15	5	800	40

Compression test
(acc. to European standard EN 61386-24)

RESISTANCE TO COMPRESSION	
CLASSIFICATION	COMPRESSION STRENGTH (Nt)
TYPE 250	≥ 250
TYPE 450	≥ 450
TYPE 750	≥ 750

MARKING

Every polyethylene pipe is marked with permanent mark that is embossed on the pipe itself. The standard colour of the mark is white, but we can also comply with the customer's requirements and make the mark in a different colour at his/her request.

The mark contains the following information:

- KONTI HIDROPLAST MACEDONIA
- Type and dimensions of the pipe
- Date of production
- Length at every meter

The pipe markings can be fully made according to the customer's requirements. Double and multi pipes have the mark only on one of the pipes. The corrugated pipes have a visible text inscription. Double pipes are characterized by two colored longitudinal lines, while with thequadruple pipes only two pipes have longitudinal lines with only one pipe being marked. The corrugate pipes with bigger dimensions have one longitudinal line with a color that is different from the basic one.

CERTIFICATES

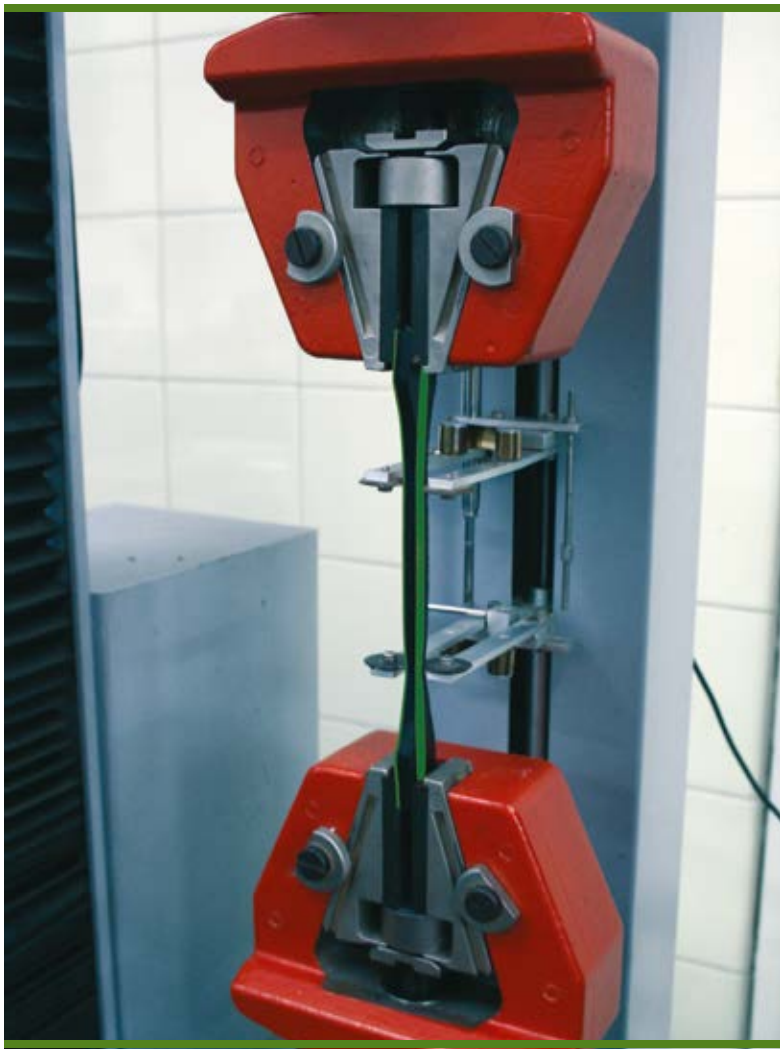
LABORATORY TESTING

MELT - MASS FLOW RATE

LONGITUDINAL REVERSION

DENSITY

ELONGATION AT BREAK



HYDROSTATIC STRENGTH AT 80°C AND 20°C

KONTI HIDROPLAST®

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